FIG. 1

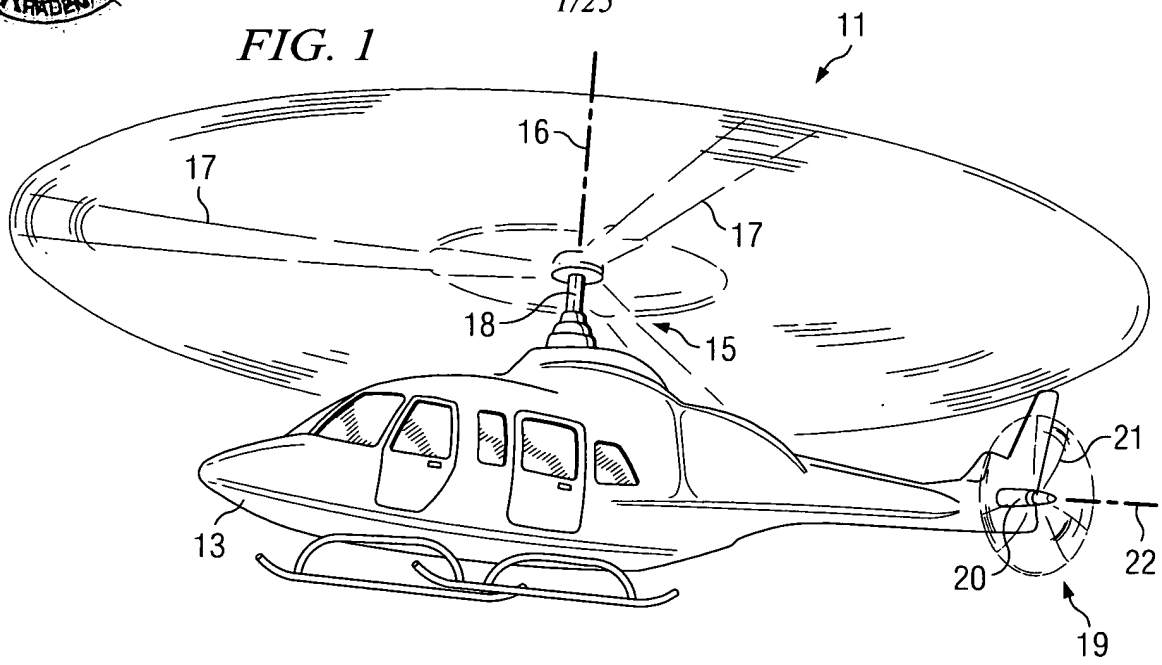
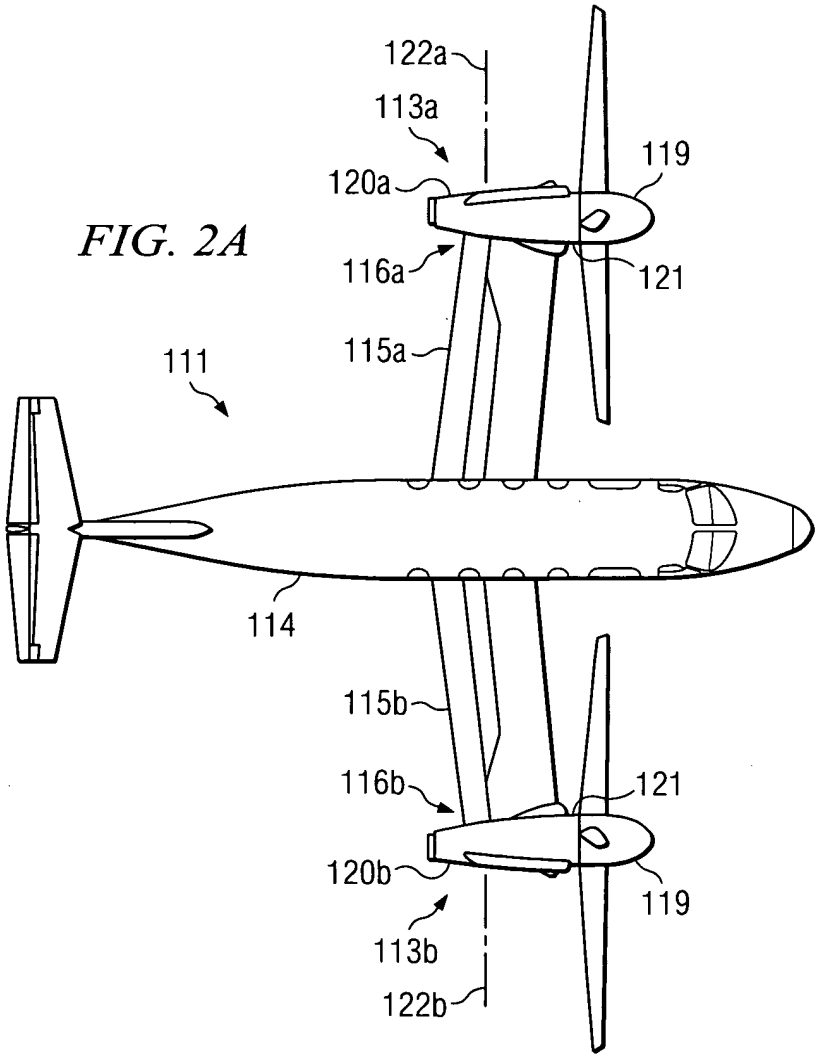


FIG. 2A



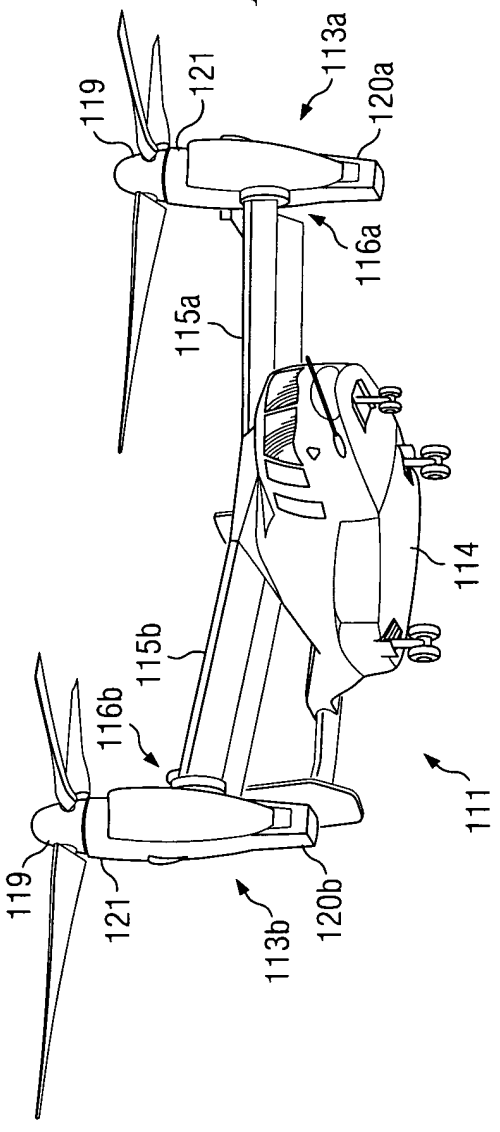

119
121
113a
120a
116a
115a
114
115b
116b
111
119
121
113b
120b

FIG. 2B

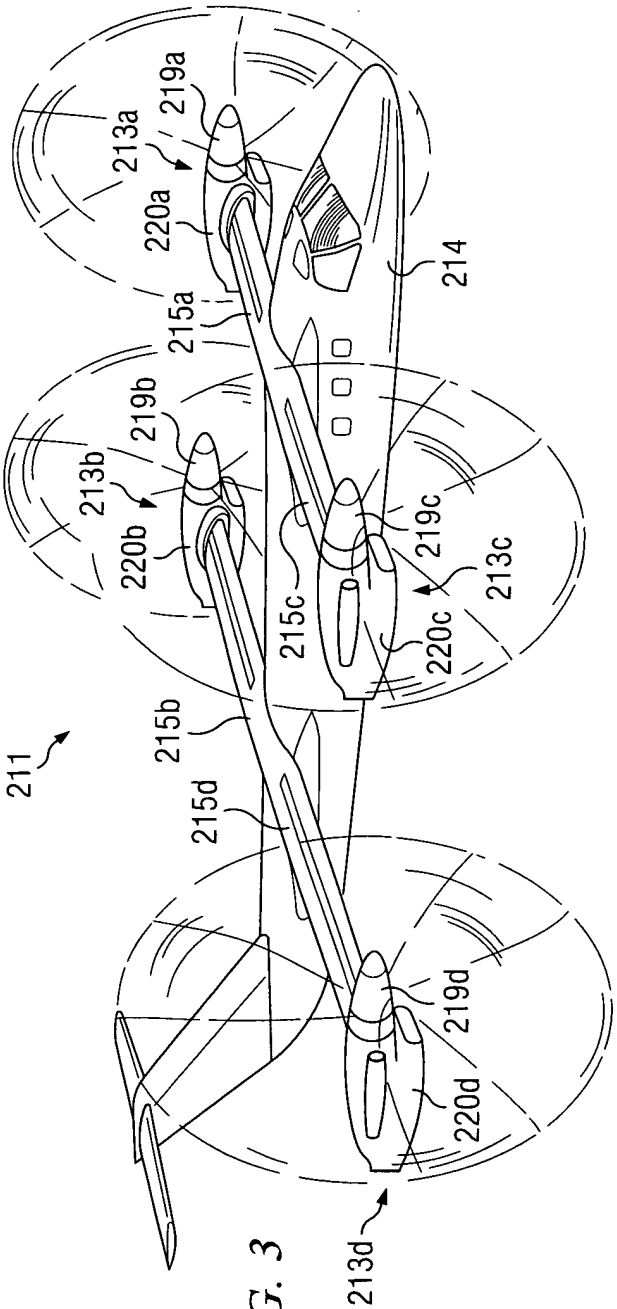

211
213a
219a
220a
214
215a
213b
219b
220b
215b
215c
219c
220c
213c
215d
219d
220d
213d

FIG. 3

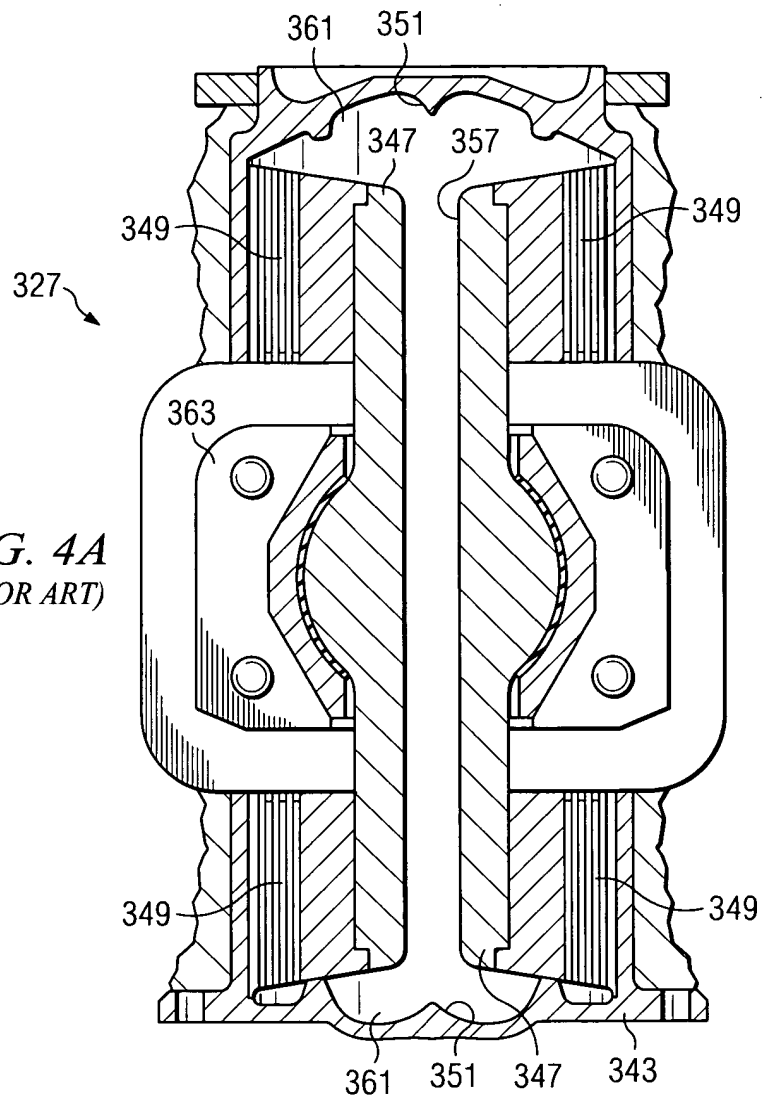


FIG. 4A
(PRIOR ART)

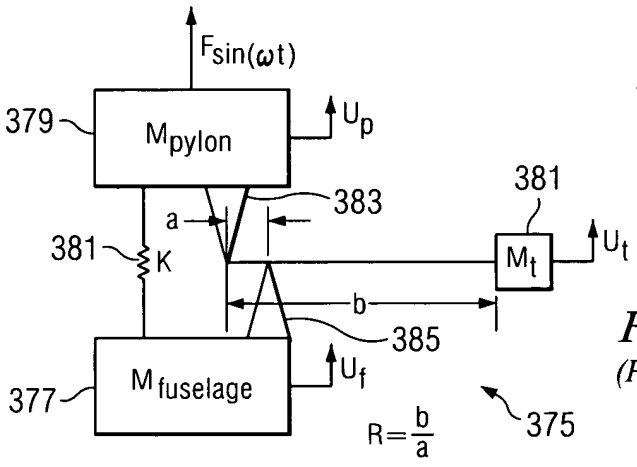


FIG. 4B
(PRIOR ART)

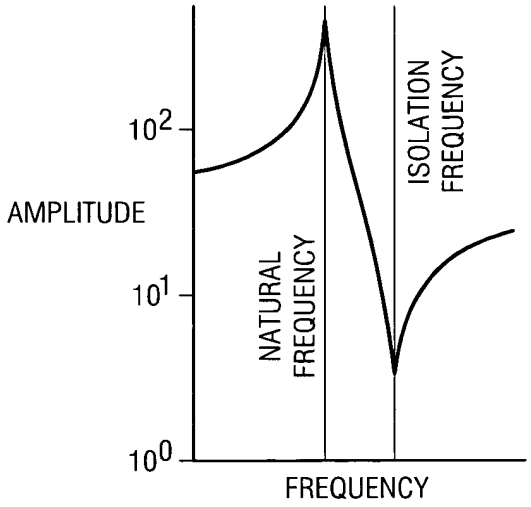


FIG. 4C
(PRIOR ART)

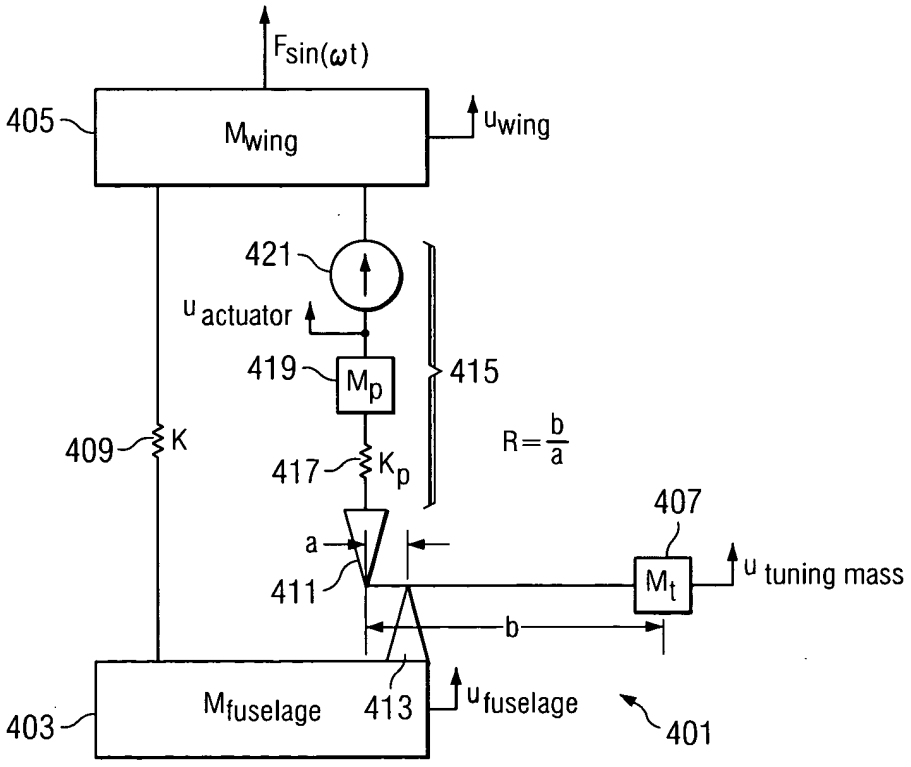


FIG. 5A

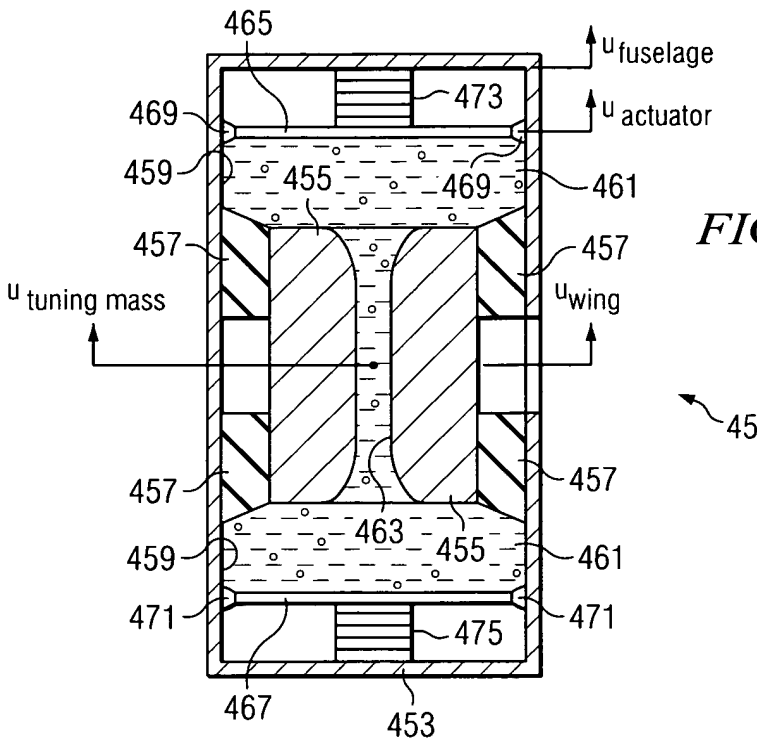

465
u fuselage
473
u actuator
469
459
455
469
461
457
457
u tuning mass
u wing
451
457
457
463
459
455
461
471
471
475
467
453

FIG. 5B

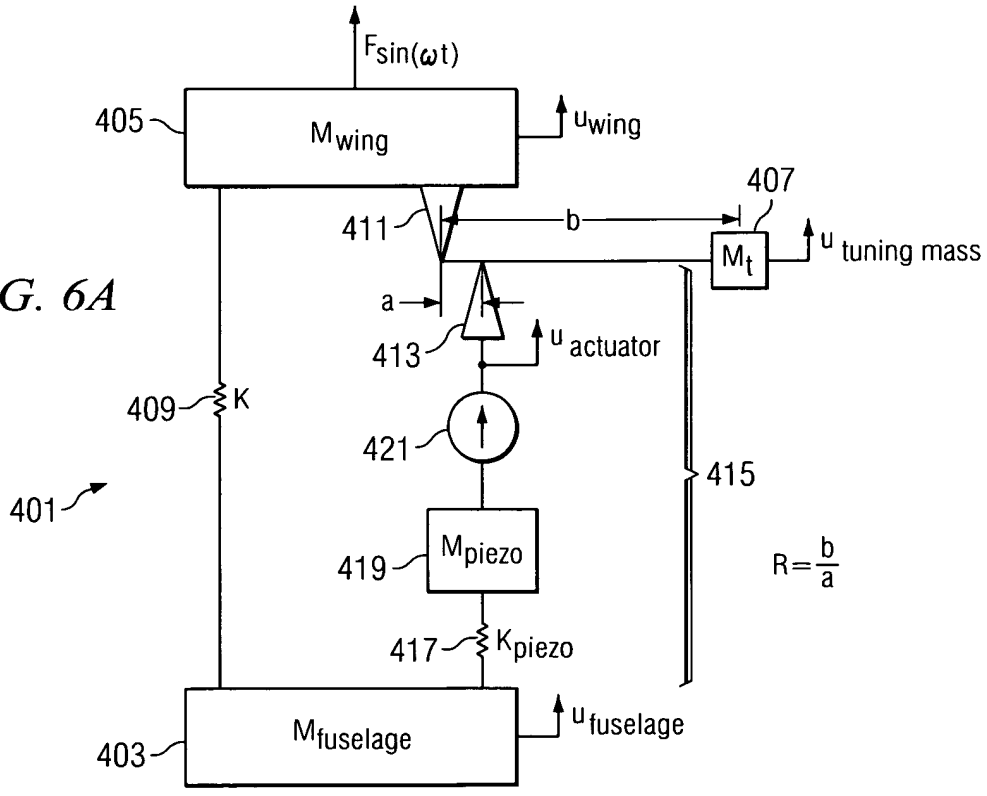

F sin(ωt)
405
M wing
u wing
407
411
b
M t
u tuning mass
a
413
u actuator
409
K
421
415
401
419
M piezo
R=b/a
417
K piezo
M fuselage
u fuselage
403

FIG. 6A

FIG. 6B

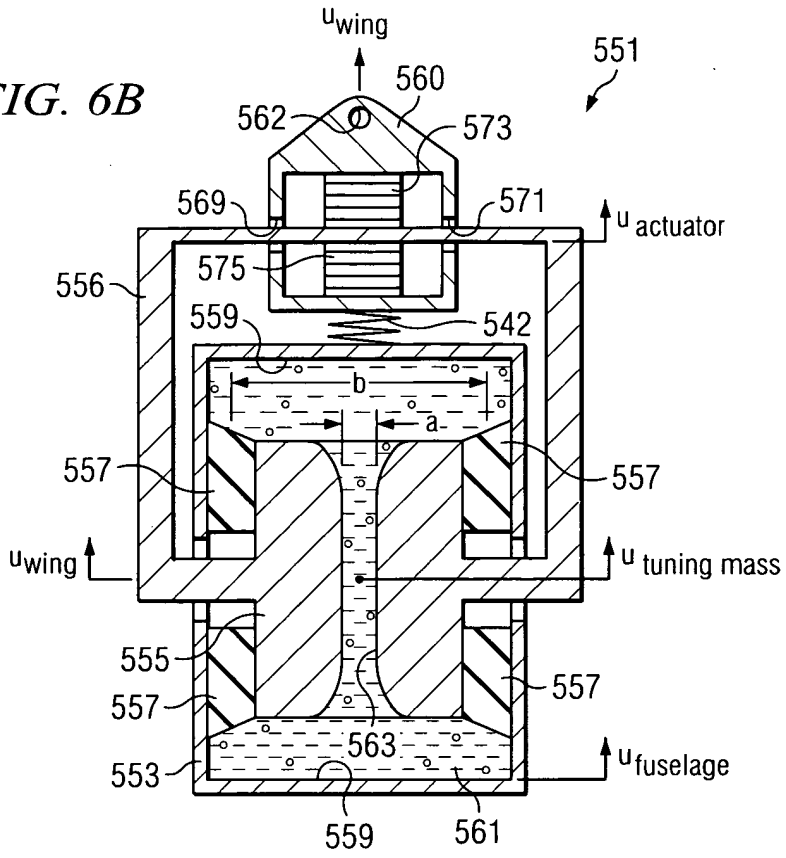


FIG. 7A

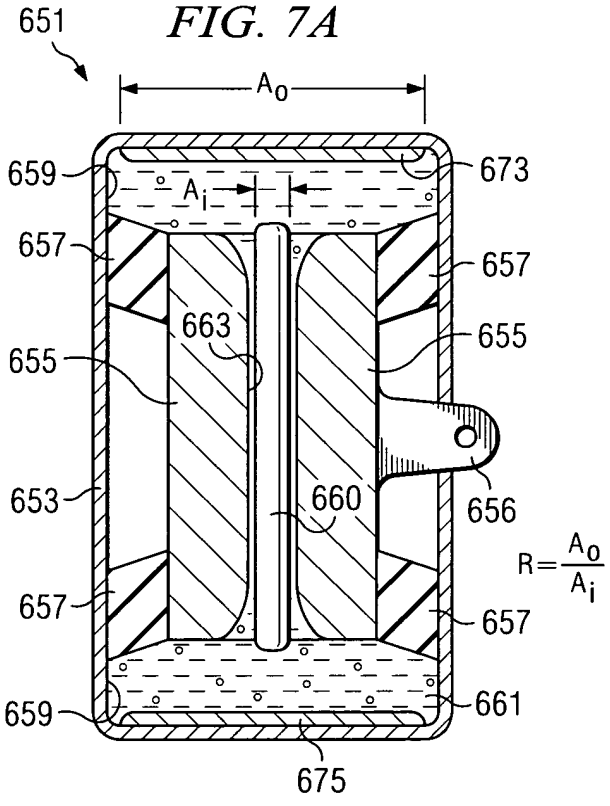


FIG. 7B

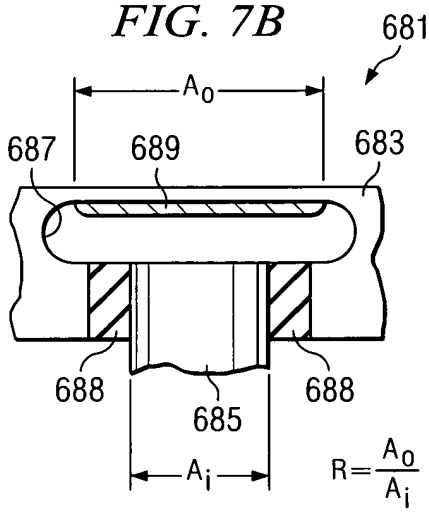


FIG. 7C

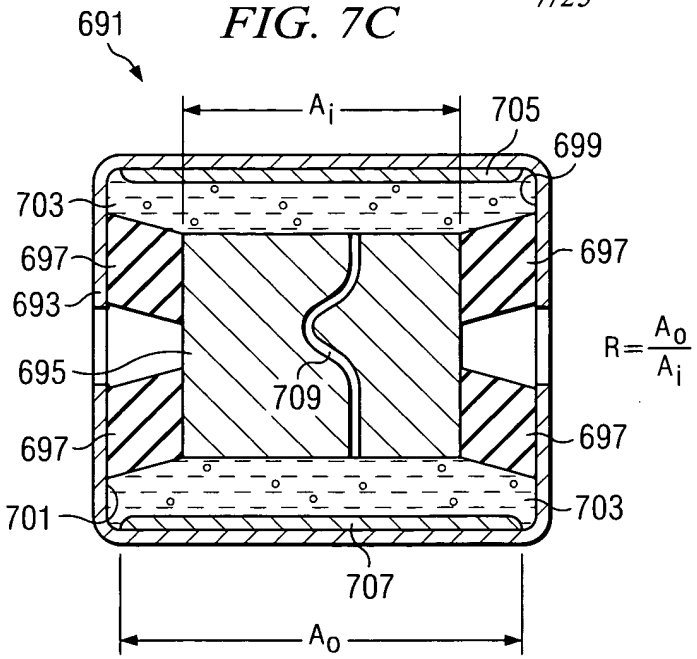

691
A_i
705
699
703
697
697
693
695
709
697
697
701
703
707
A_o
$R=\frac{A_o}{A_i}$

FIG. 7D

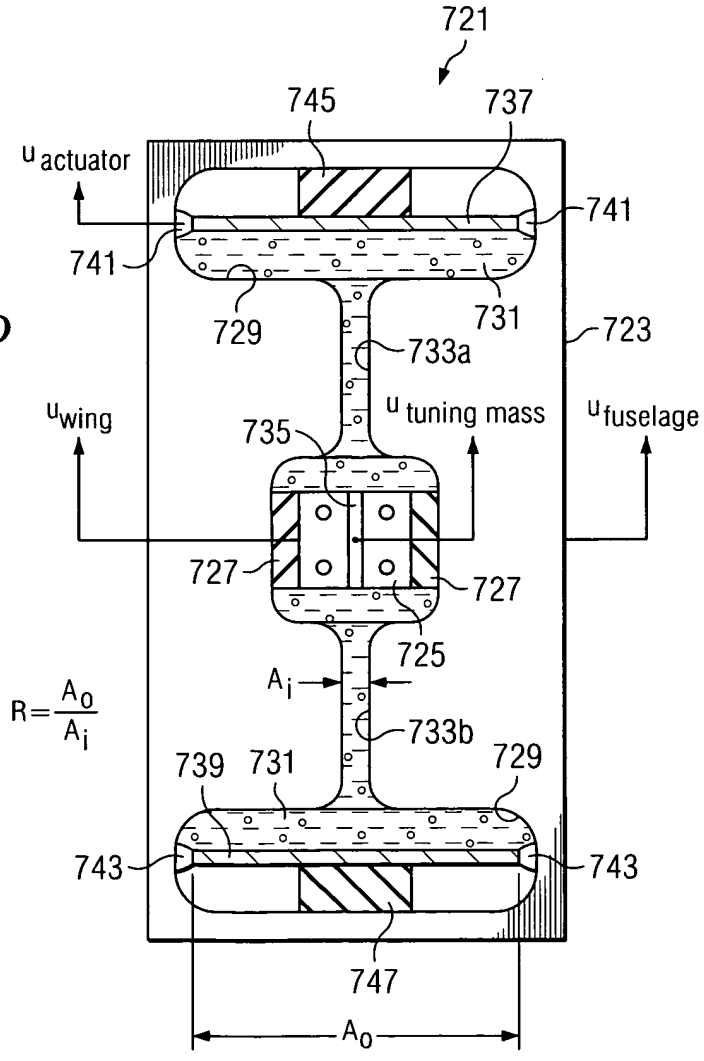

721
745
737
$u_{actuator}$
741
741
729
731
723
733a
u_{wing}
$u_{tuning\ mass}$
$u_{fuselage}$
735
727
727
725
A_i
$R=\frac{A_o}{A_i}$
733b
739
731
729
743
743
747
A_o

FIG. 8

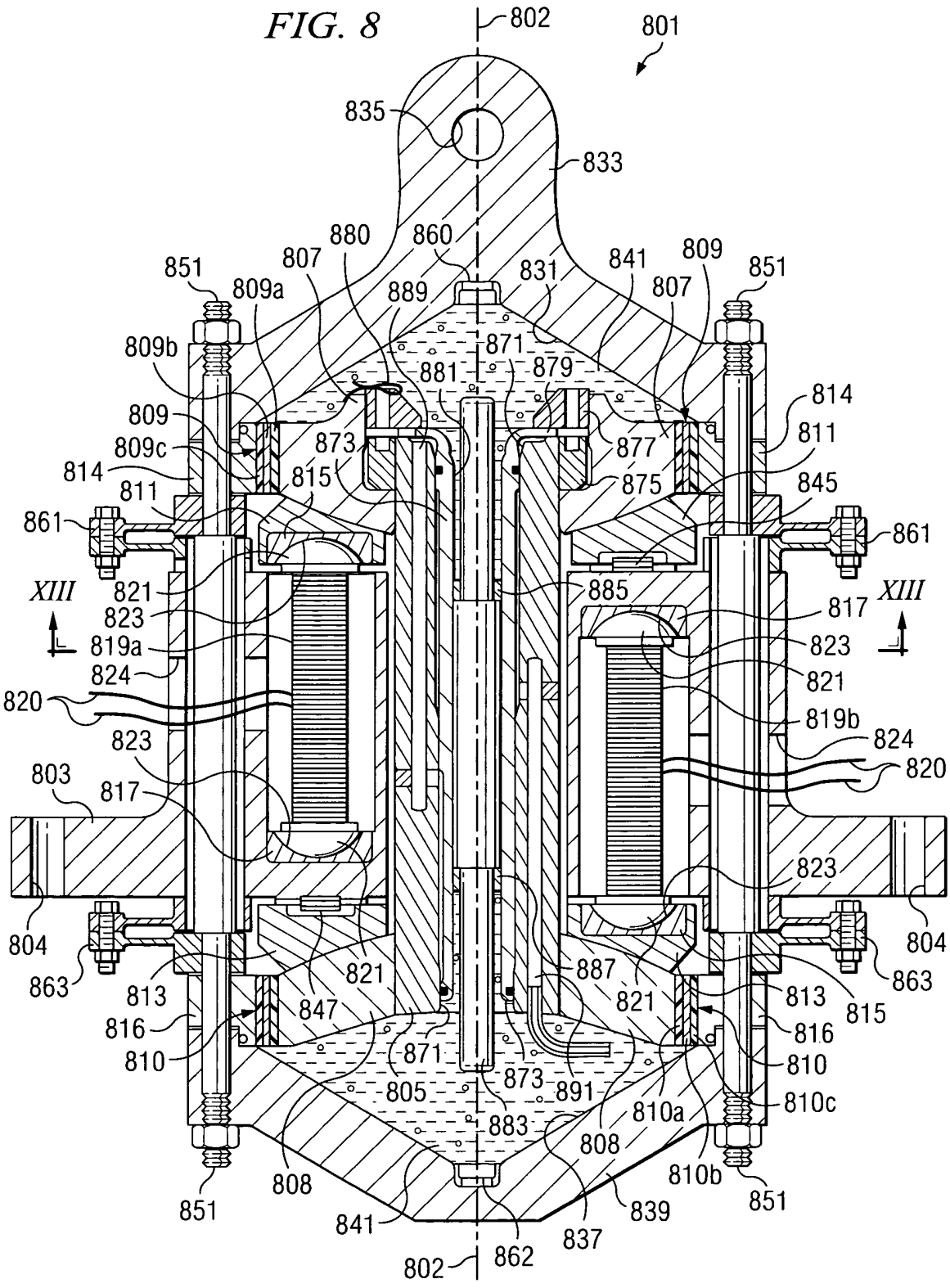

802
801
835
833
880
860
807
851
809a
889
831
841
809
807
851
809b
871
881
879
814
809
873
877
811
809c
815
875
845
814
811
861
861
XIII
821
885
817
XIII
823
819a
823
824
821
820
819b
824
823
820
803
817
823
804
804
863
863
813
821
887
821
813
815
847
816
816
810
871
810
805
873
891
810c
883
810a
808
808
810b
851
851
841
839
837
862
802

FIG. 9

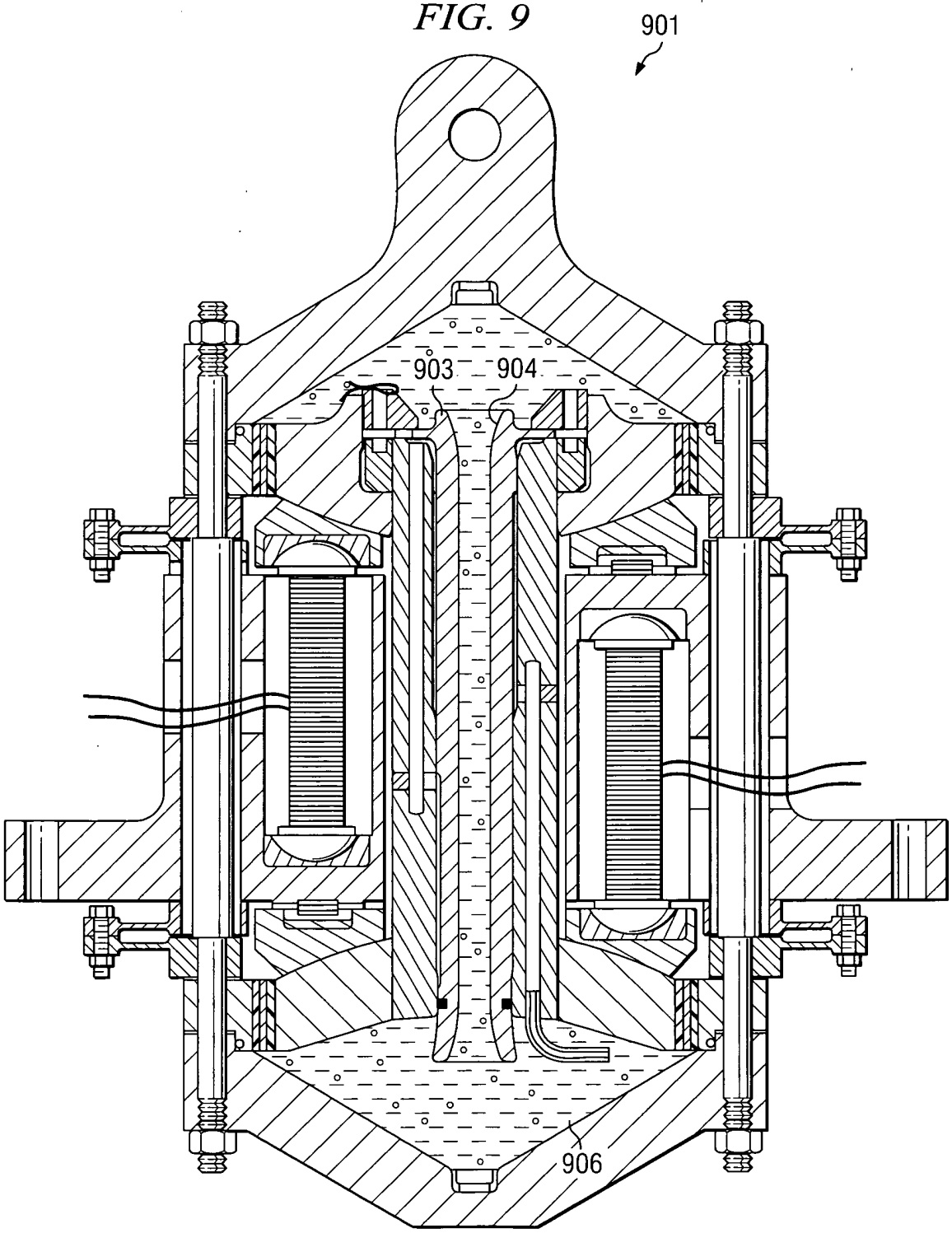


FIG. 10

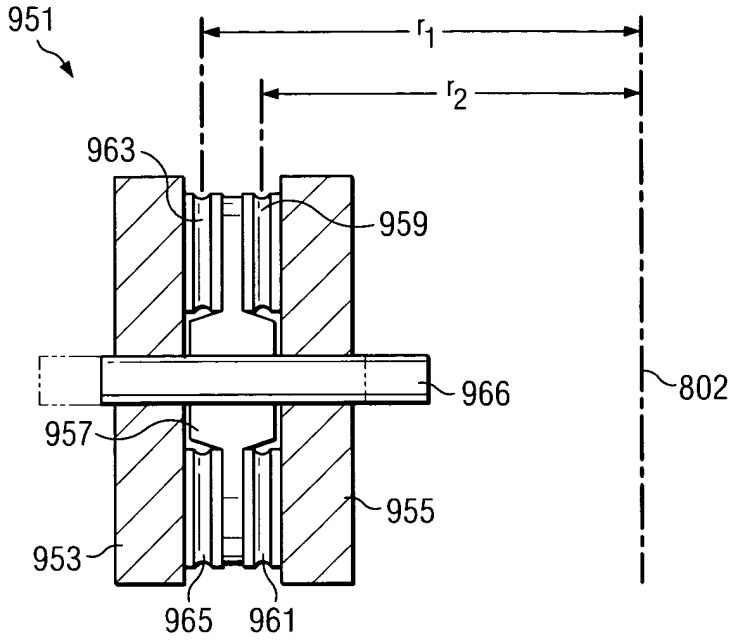


FIG. 11

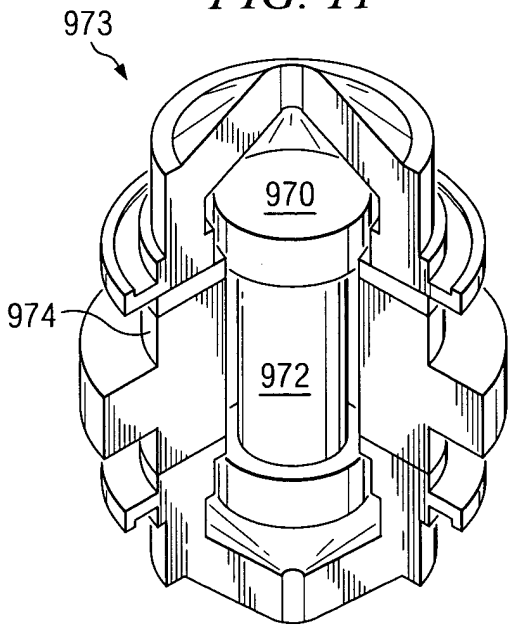


FIG. 12

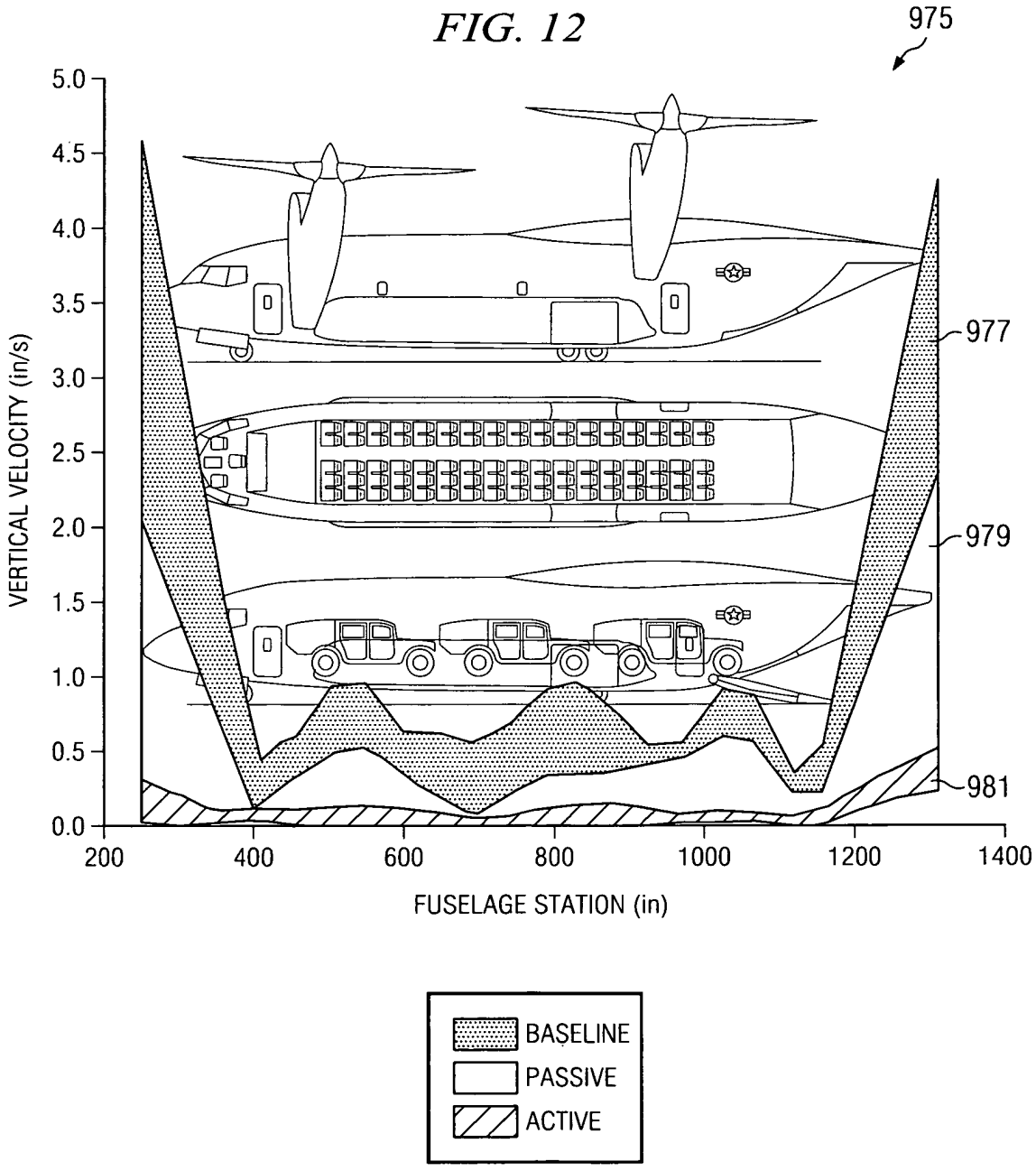
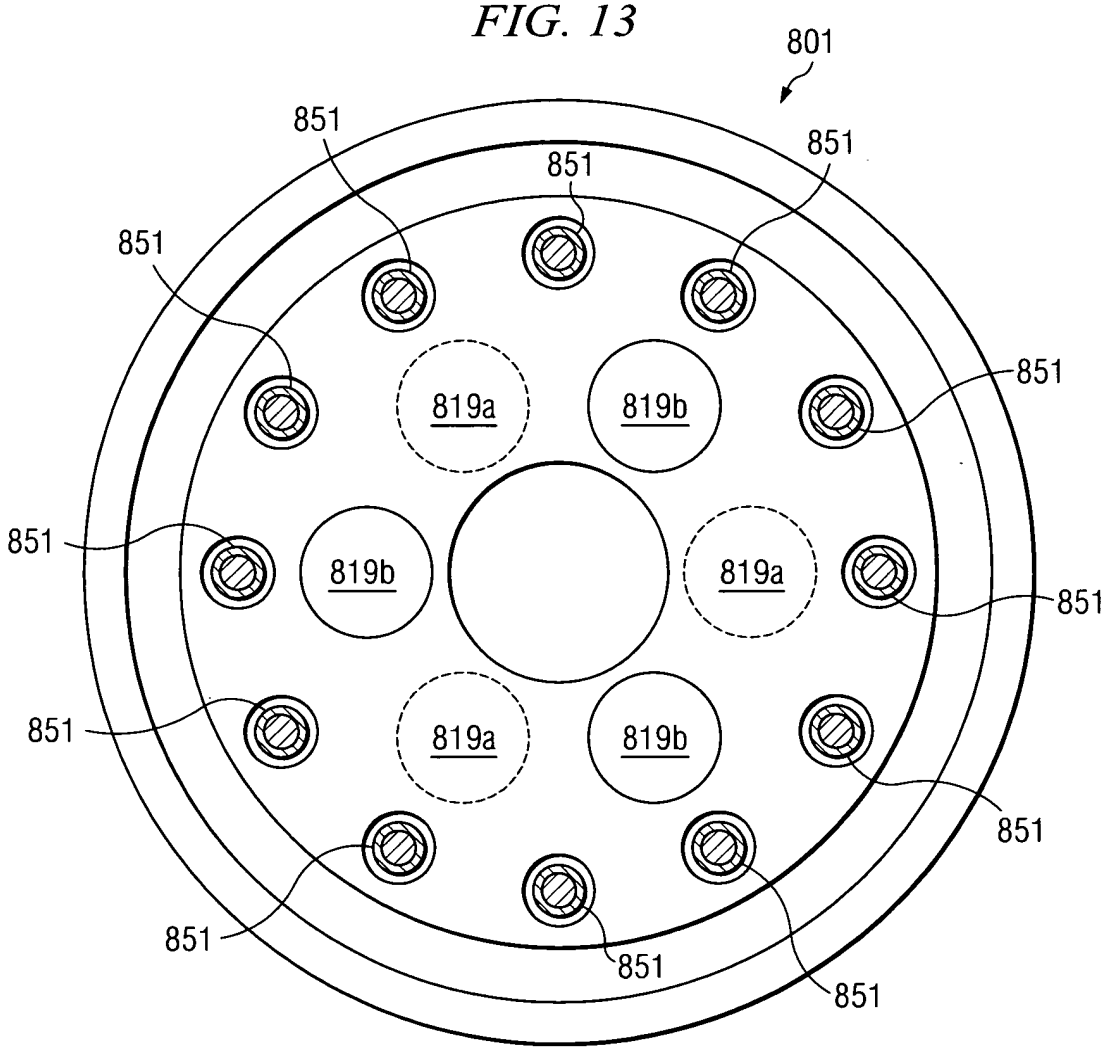

975
977
979
981
VERTICAL VELOCITY (in/s)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
200
400
600
800
1000
1200
1400
FUSELAGE STATION (in)
BASELINE
PASSIVE
ACTIVE

FIG. 13


801
851
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851
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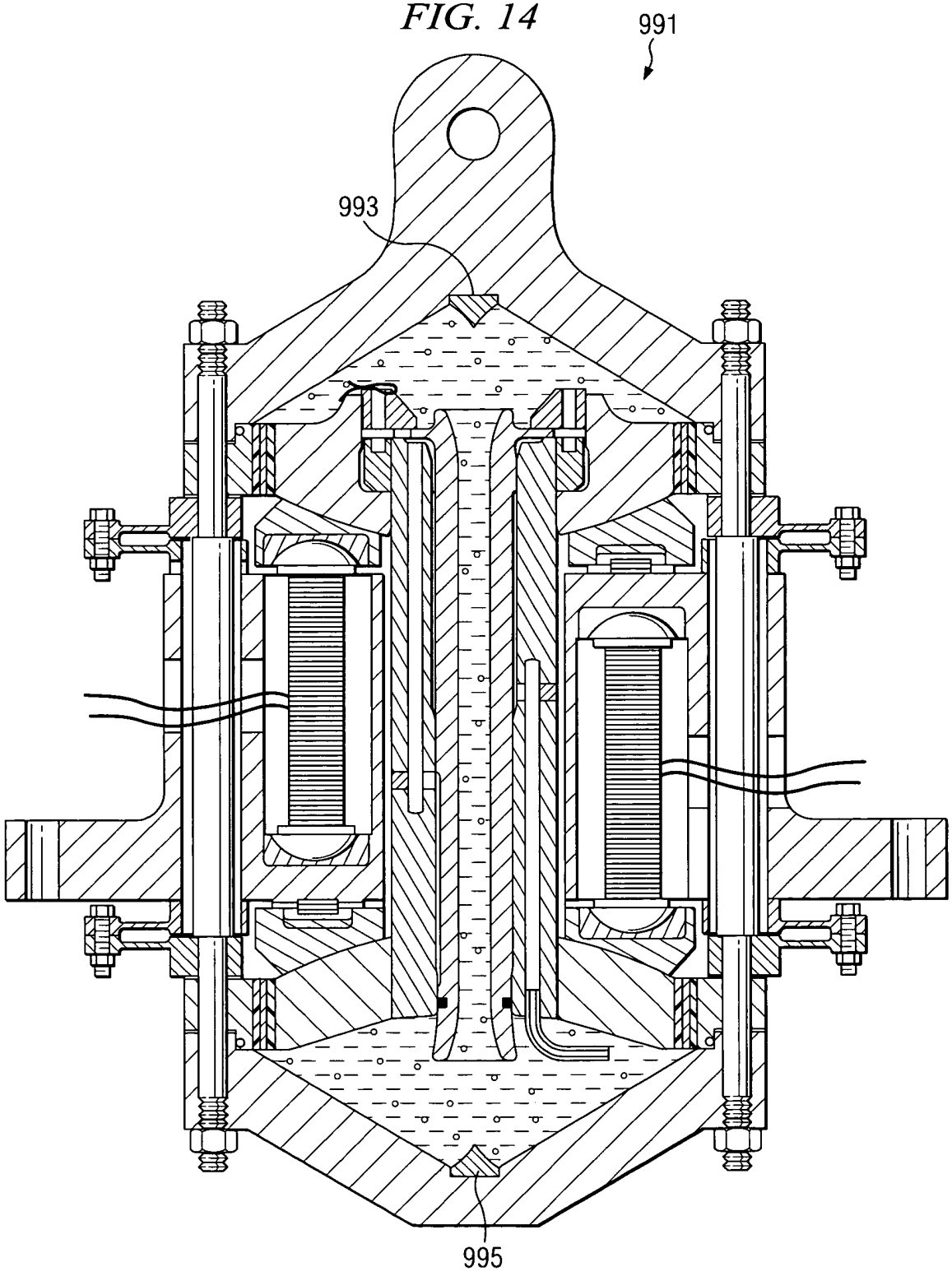
851
851
851
851
851
851
851
851
851
819a
819b
819b
819a
819a
819b

FIG. 14



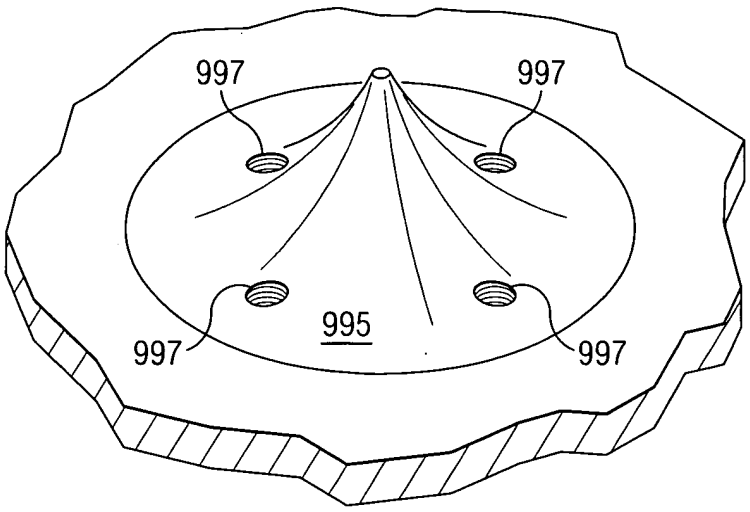
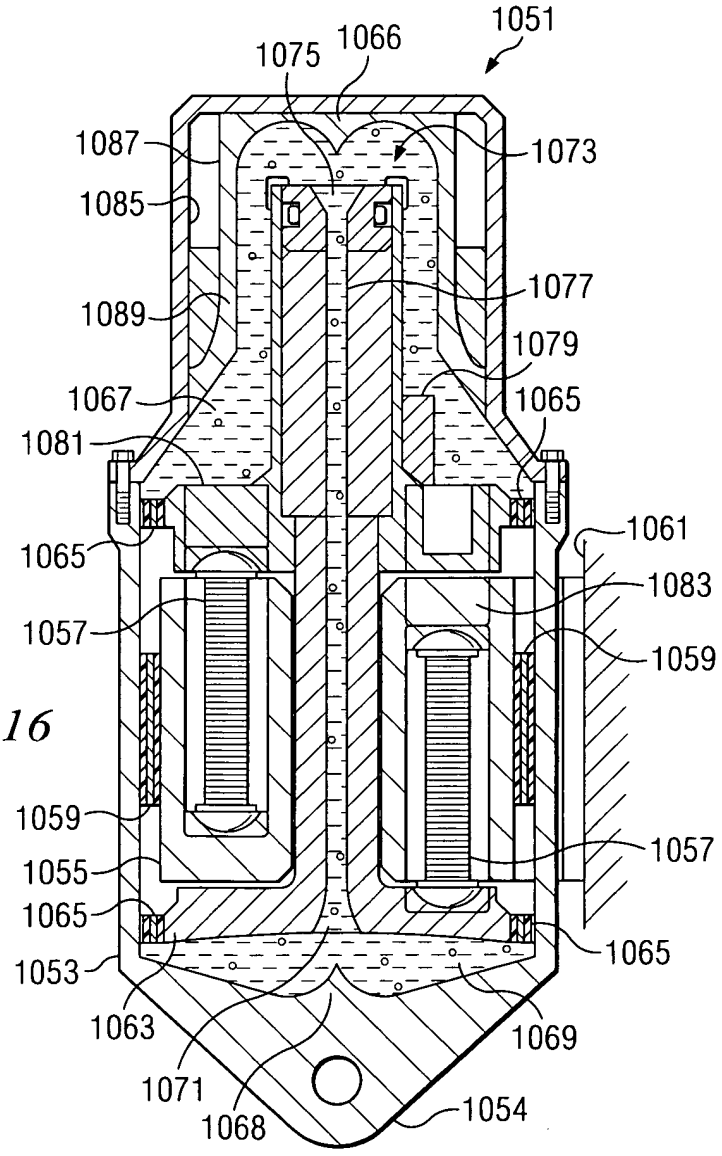

997
997
995
997
997

FIG. 15


1051
1075
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1087
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1085
1077
1089
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1067
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1081
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1061
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1053
1063
1069
1071
1068
1054

FIG. 16

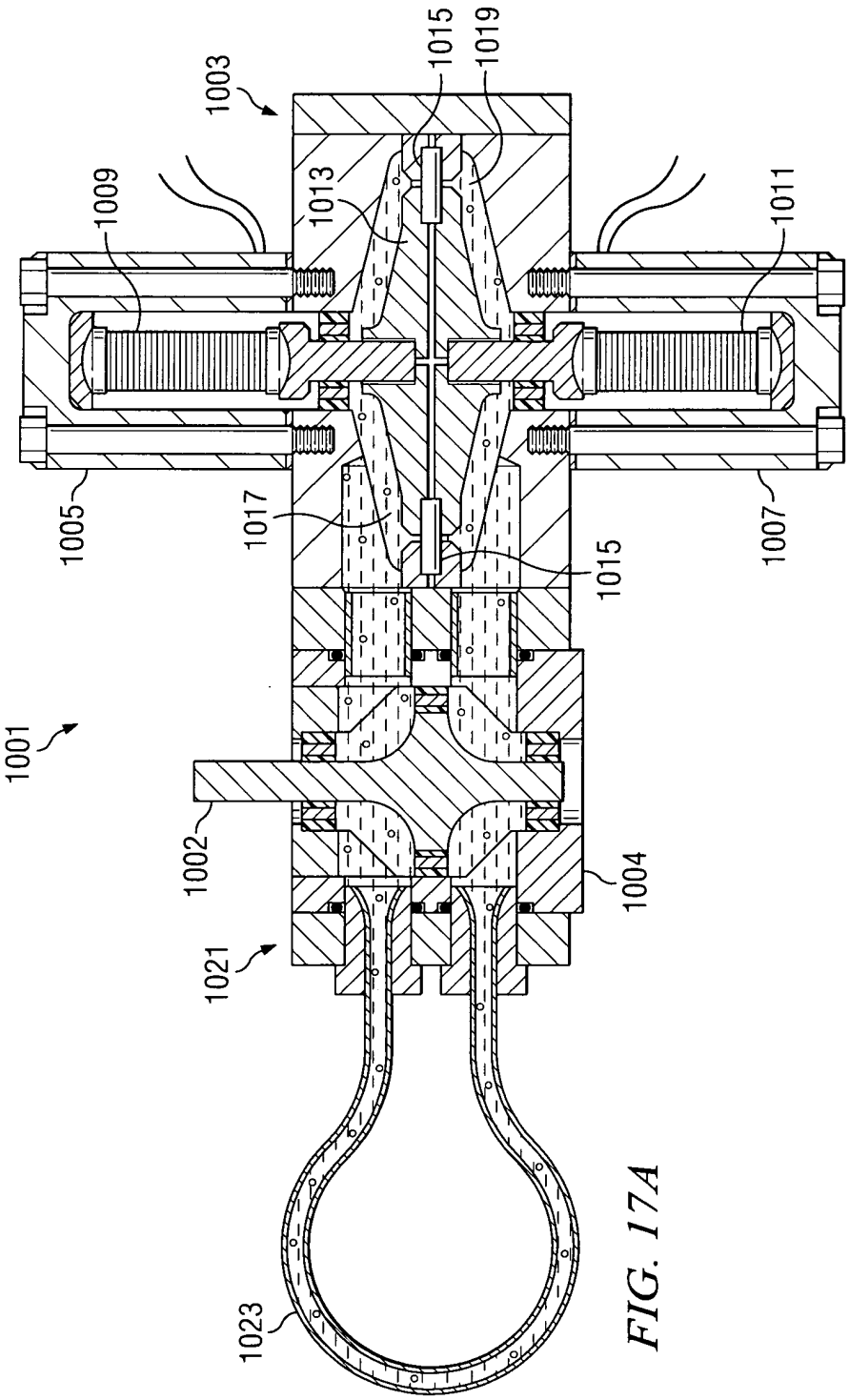

1001
1002
1003
1004
1005
1007
1009
1011
1013
1015
1015
1017
1019
1021
1023

FIG. 17A

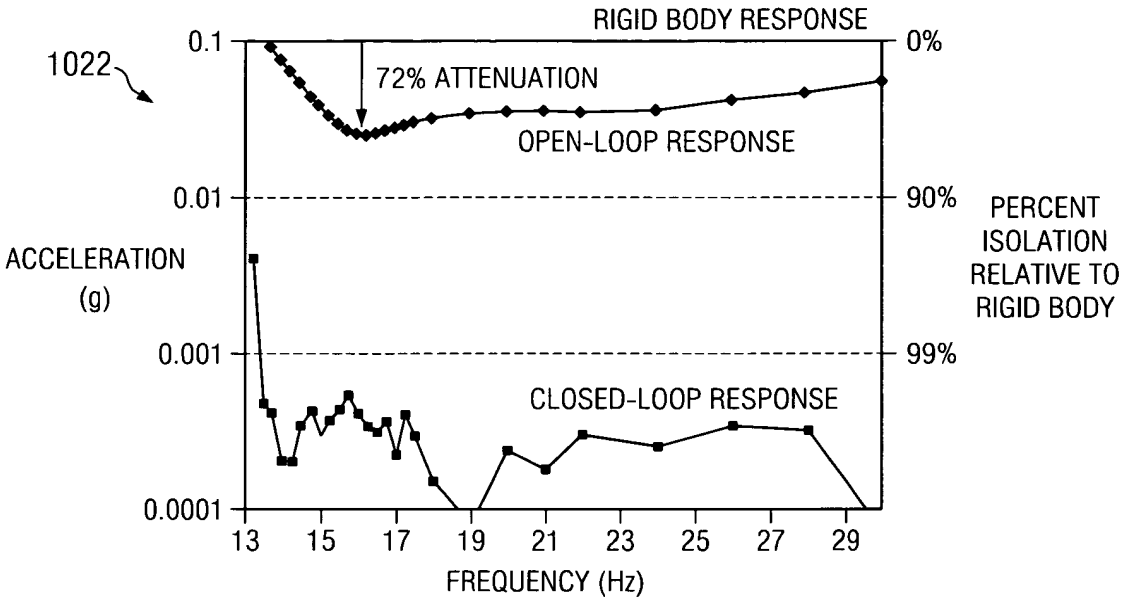


FIG. 17B

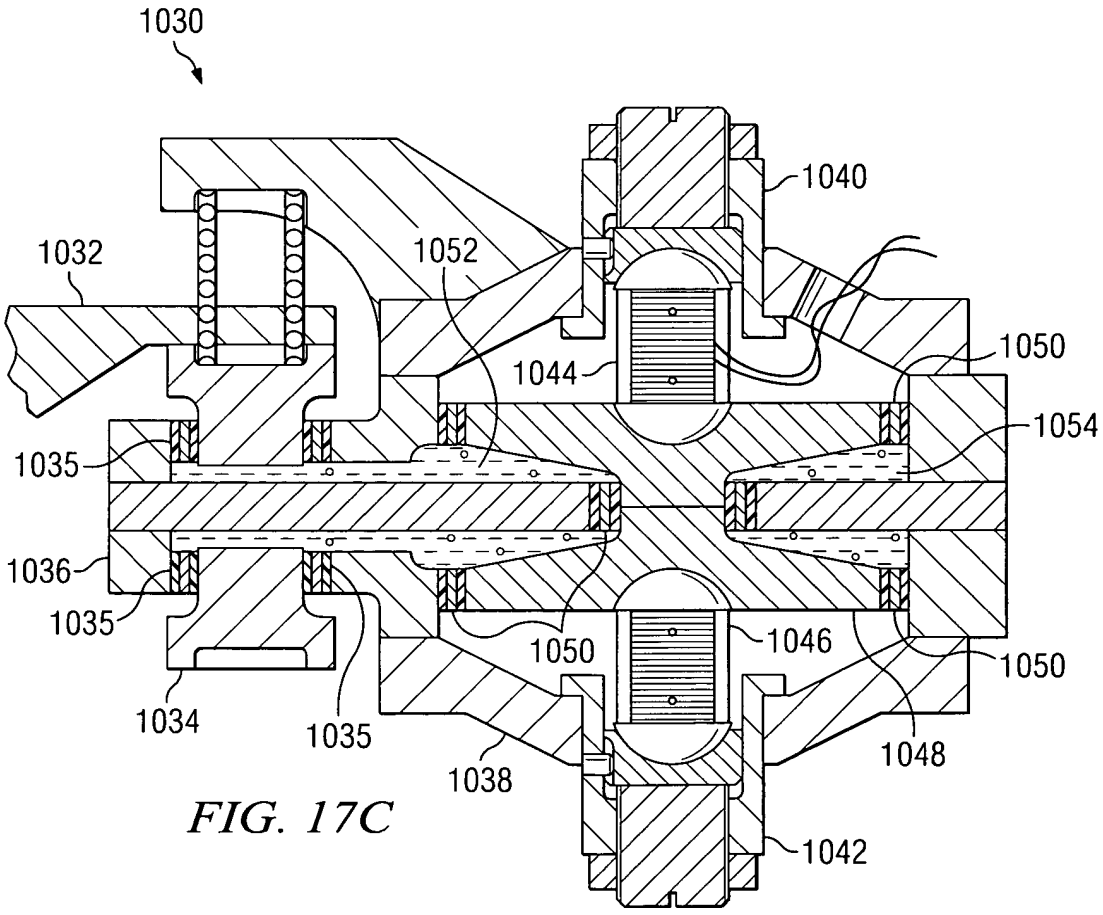


FIG. 17C

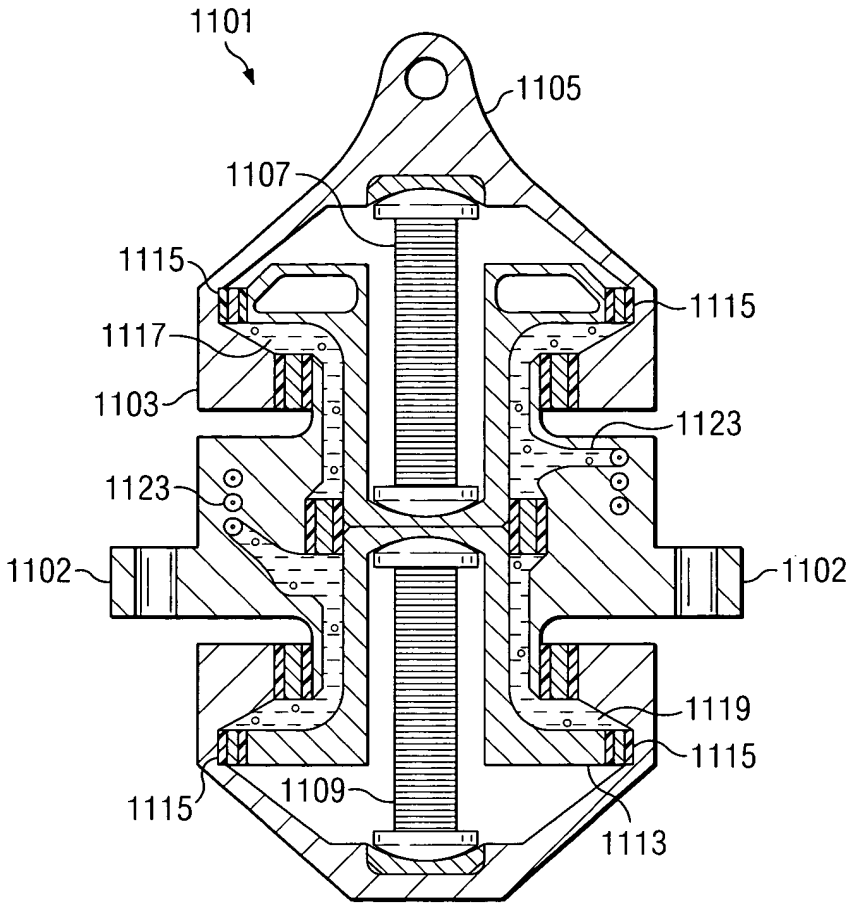


FIG. 18

GOVERNING EQUATION FOR ISOLATION FREQUENCY

$$f_{isolation} = \frac{1}{2\pi}\sqrt{\frac{4K\eta g}{R_{LIVE}(R_{LIVE}-1)\pi d_t^2 l_t \rho_t}}$$

FIG. 19A

AREA RATIOS

$$R_{piezo} = \frac{(2.1884)^2}{(1.1447)^2} = 3.65$$

FIG. 19B

LENGTH AND NUMBER OF TURNS
OF FLUID TUNING PASSAGE

$$l_t = \frac{4K\eta g}{R_{LIVE}(R_{LIVE}-1)\pi d_t^2 \rho_t (2\pi f_{isolation})^2}$$

$$N = \frac{l_t}{2\pi r_t}$$

FIG. 19C

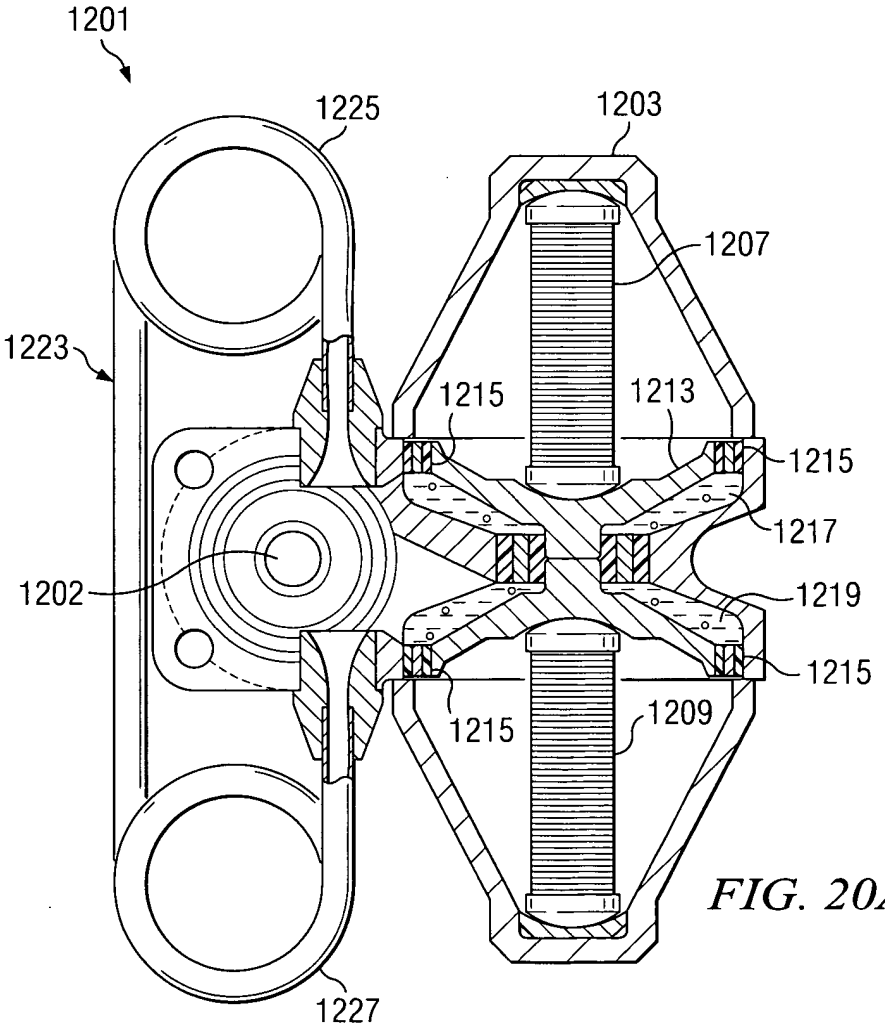


FIG. 20A

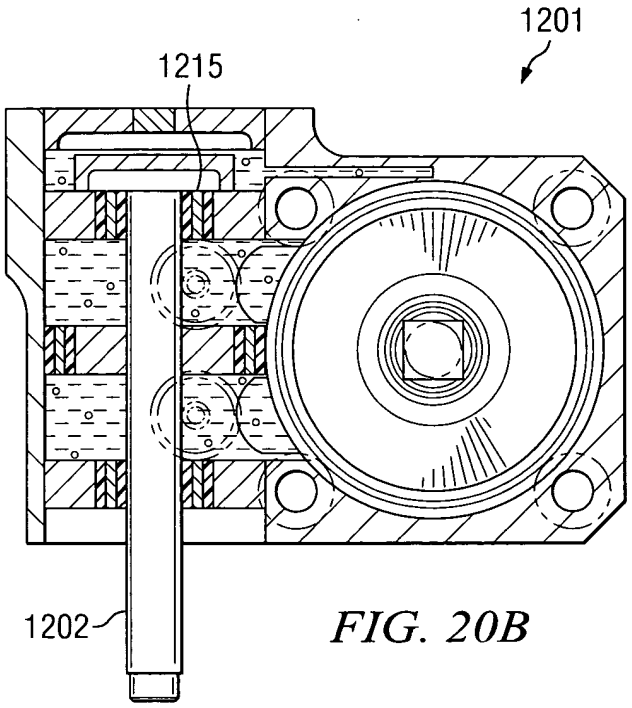


FIG. 20B

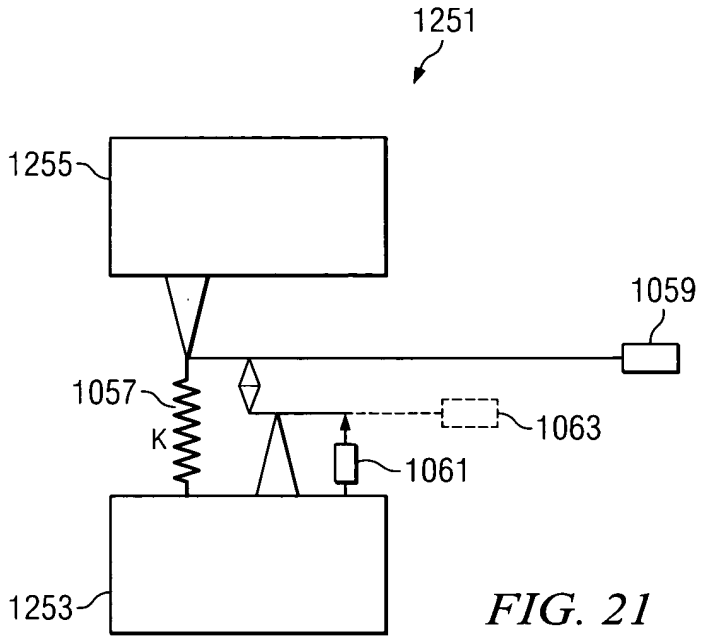


FIG. 21

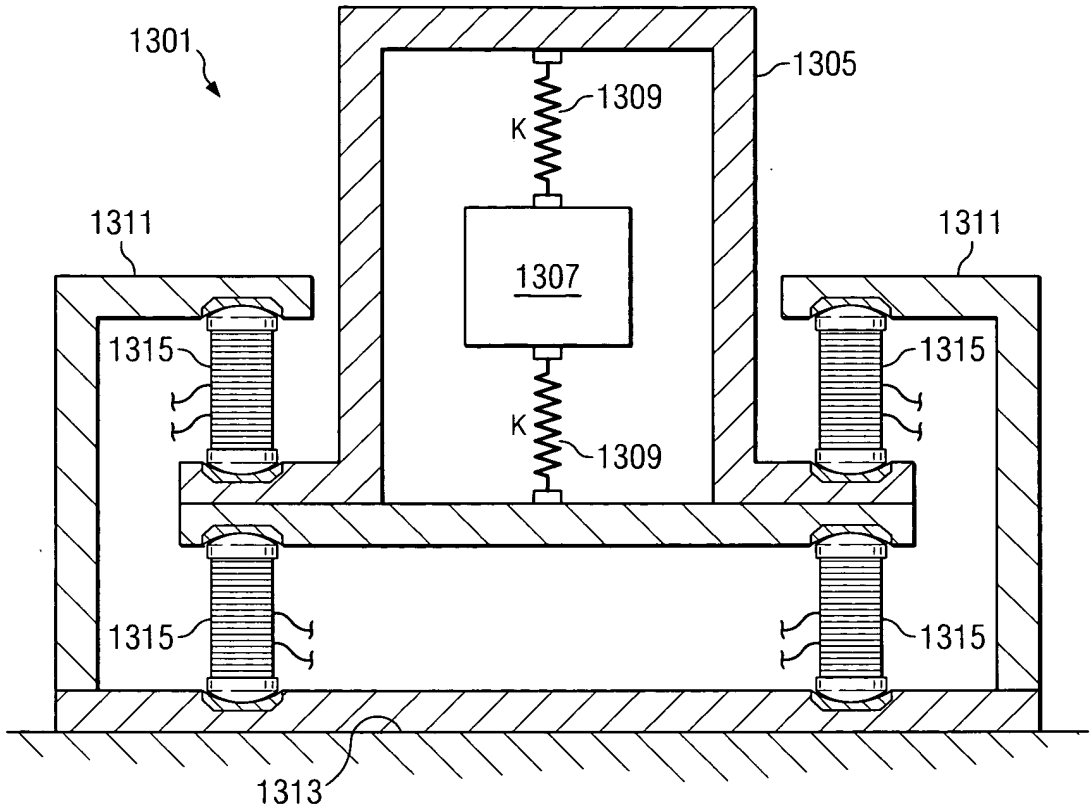


FIG. 22A

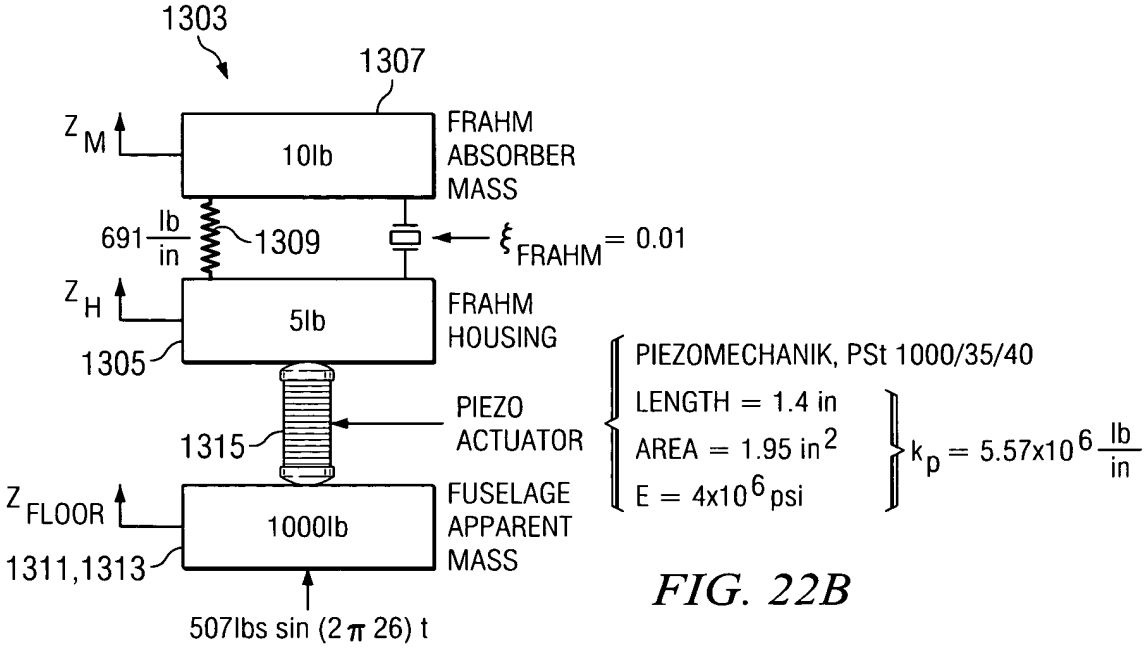
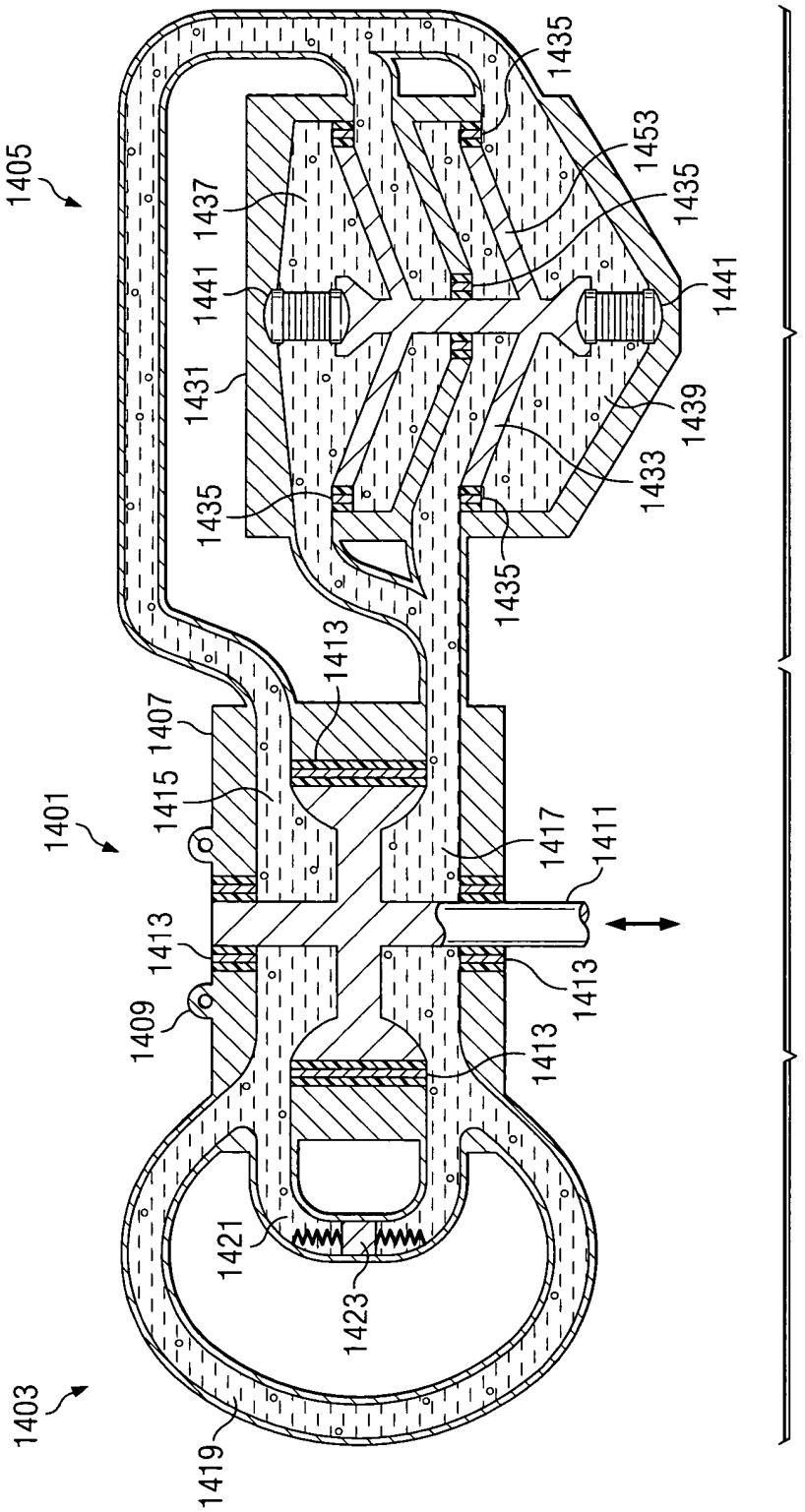


FIG. 22B


1405
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1435
1413
1407
1415
1401
1417
1411
1413
1413
1409
1413
1421
1423
1403
1419
PIEZO-PUMPER
LIVE

FIG. 23A

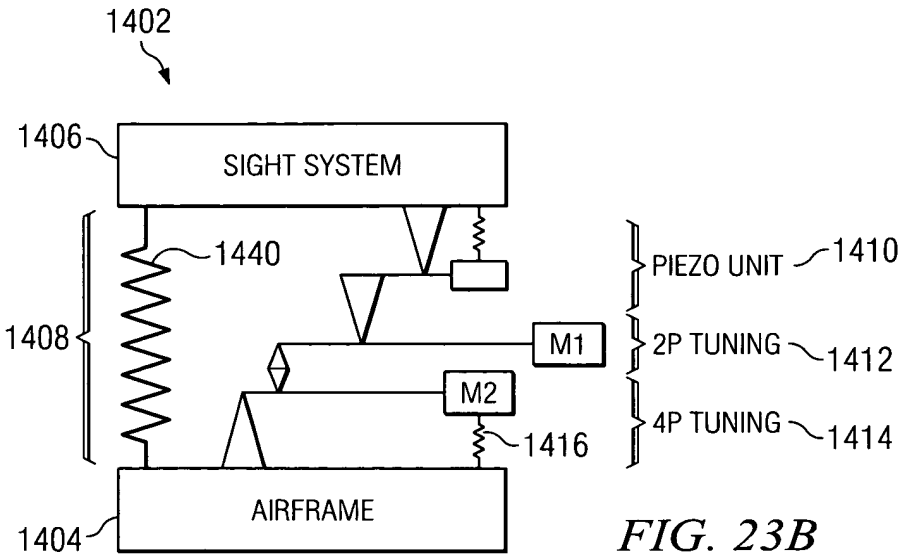

FIG. 23B

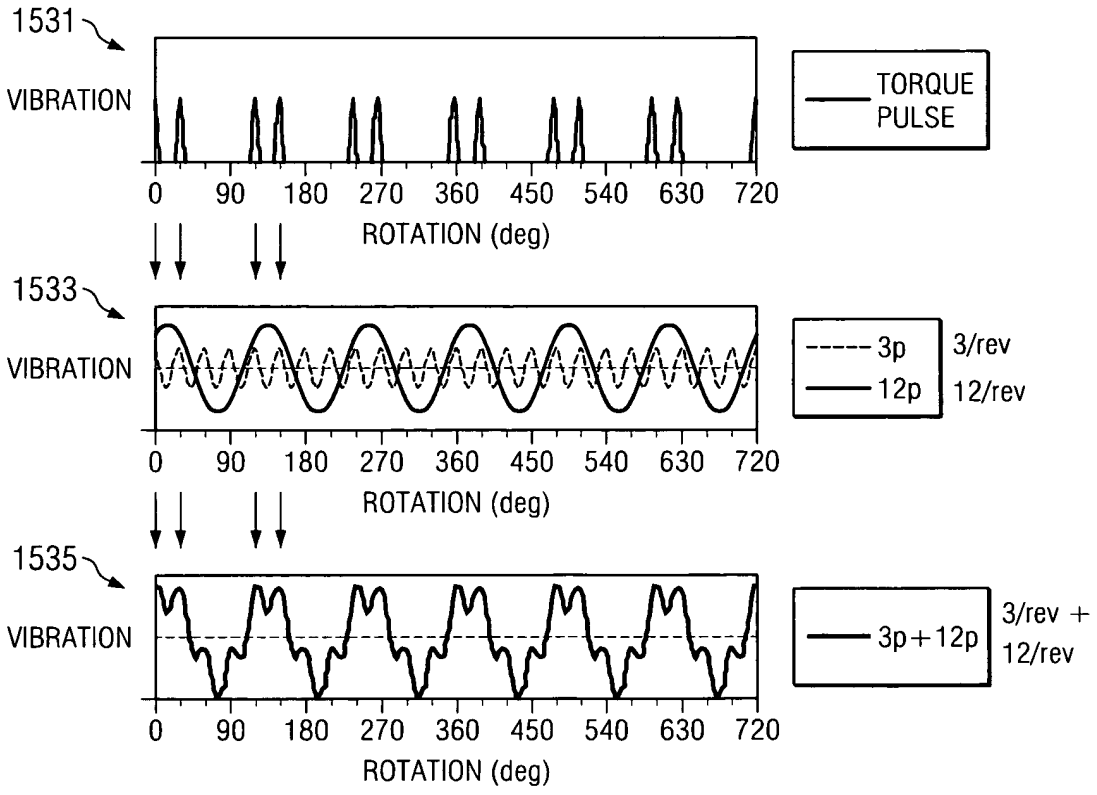

FIG. 24

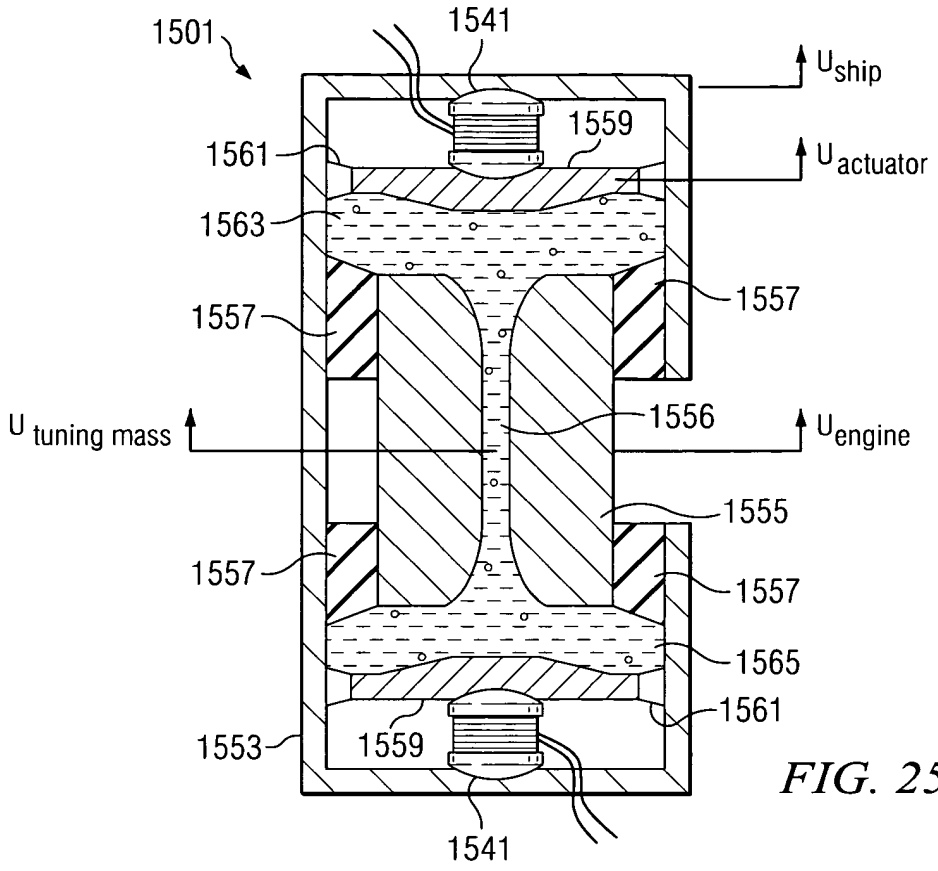

FIG. 25A

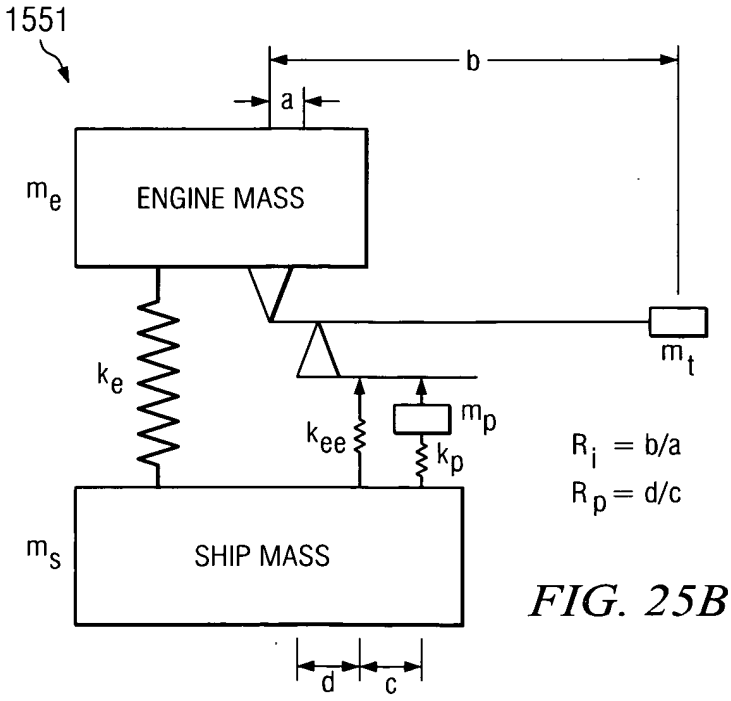

FIG. 25B

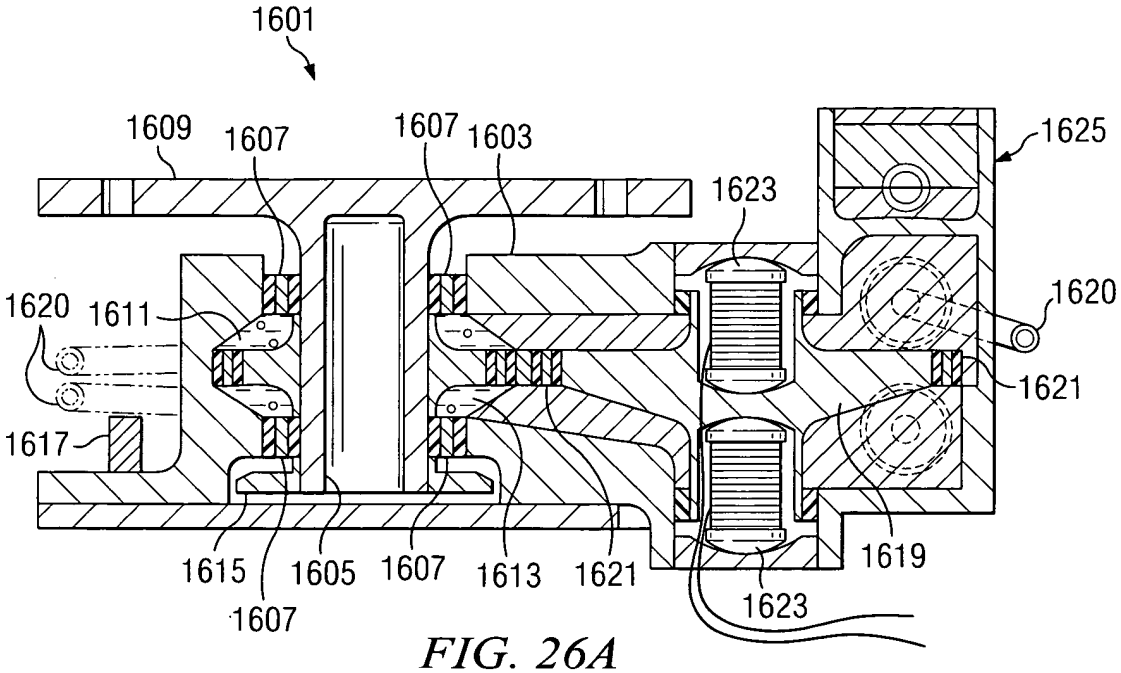

FIG. 26A

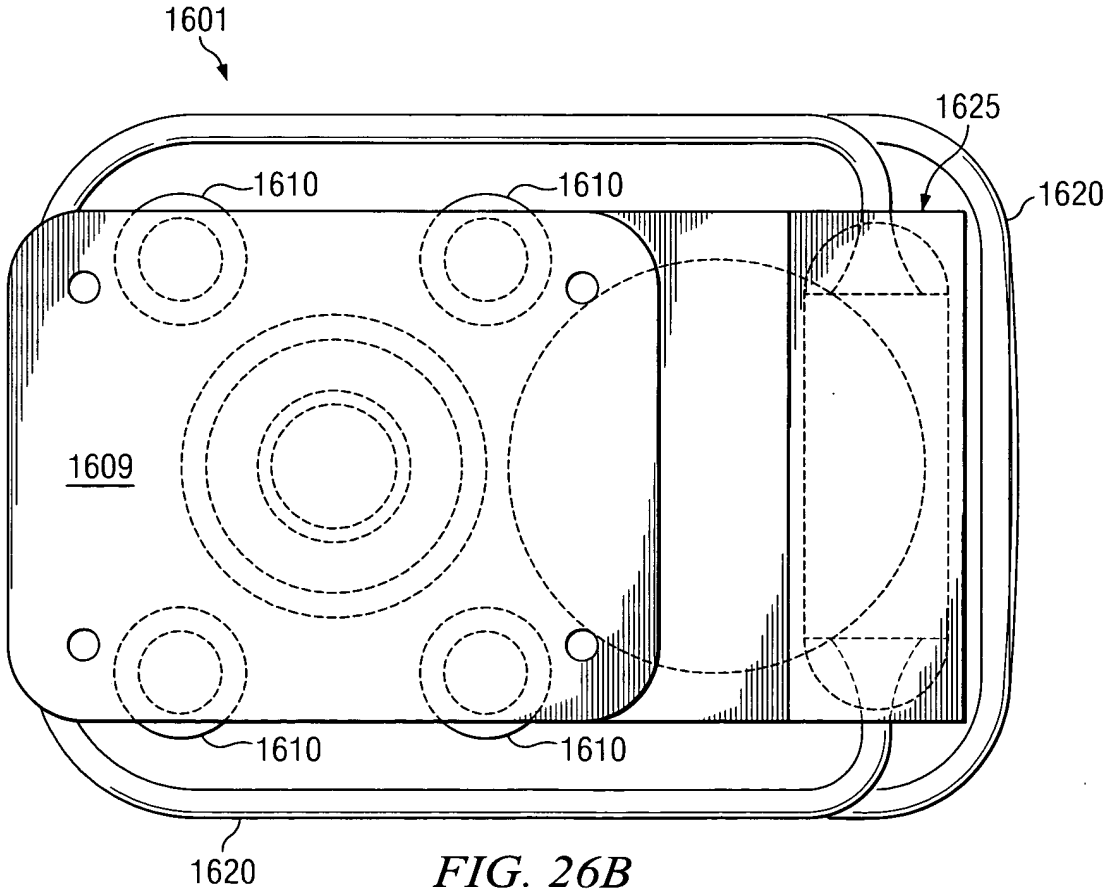

FIG. 26B

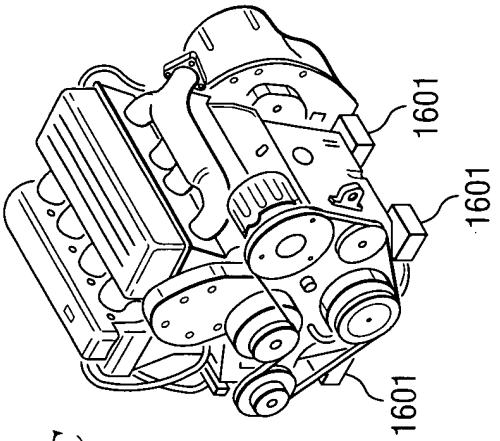

FIG. 26C

FIG. 27